

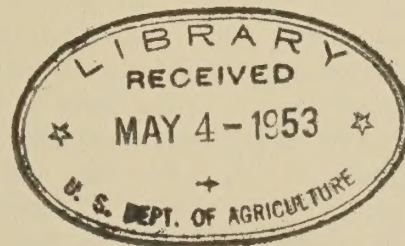
TEXAS 85 WISE

FIELD APPRAISAL ANALYSIS

Prepared by
Field Appraisal Section
Program Analyst's Office
Office of the Administrator
RURAL ELECTRIFICATION ADMINISTRATION

Field Appraisal
Completed in
October 1952

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REAR OF FIVE

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Prepared by
Field Agent
Proctor's Office
Office of the Administrator
FEDERAL BUREAU OF INVESTIGATION

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January 26, 1953

Field Appraisal Section
Program Analyst's Office
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SUMMARY AND CONCLUSION
TEXAS 85 WISE

AREA CHARACTERISTICS

The area wherein the Wise Electric Cooperative, Incorporated, is located has decreased in population by an estimated 16 percent during the decade 1940-1950. The average size of farm has increased from 249 to 270 acres during the 5 years 1945-1950. The number of farms decreased 10 percent during this 5-year period. Average value of land and buildings was about \$10,500 in 1950, and the average gross income from sale of farm products during 1949 was \$2,700. More than three-quarters of the agricultural income was from the sale of livestock and livestock products. The service area has experienced drought conditions for the last 3 years. Agricultural income in the area is supplemented with off-farm income resulting from oil and gas drilling, brick, pottery clays, coal and limestone for fertilizer.

ULTIMATE NUMBER OF CONSUMERS

As of August 31, 1952, this system was serving 2,533 consumers. The manager estimates that an additional 562 farm and 235 nonfarm and small commercial consumers either exist at present or are potential consumers resulting from new construction. The appraiser was of the opinion that if population trends in the area were any criteria, the manager's estimates were optimistic; that it is doubtful whether the system will ever be serving any more consumers at any one time than they are at present.

ESTIMATED FUTURE CONSUMPTION OF ELECTRICITY

Since 1940, for the farm consumers interviewed in connection with this survey, average monthly consumption rose from 34 kwh to 135 kwh during the 12 months prior to the field appraisal. This was an increase of 9 kwh per month per year. Since the end of World War II in 1946, during which time electrical appliances and equipment were becoming generally available, the average monthly usage increased at the rate of only 4 kwh per month per year. Farm consumers are using electricity at 78 percent of the average usage determined by REA for the country as a whole; nonfarm consumers were using it at the rate of 58 percent of the average. Sixty-five percent of the consumers interviewed indicated they were using or planning to use Liquid Petroleum gas for one or more appliances. An additional 9 percent were using natural gas. Nearly one-half of the expected increase in electric consumption during the next 3 years for this cooperative is expected to be derived from additions of freezer cabinets and water heaters in the household.

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Based on all factors believed to be significant, this analysis leads to the following estimates, which are certified as being reasonable and may be expected to be attained in the years specified.

<u>Class of Consumer</u>	12 Months Ended			
	<u>November 30, 1952</u>	<u>1955</u>	<u>1958</u>	<u>1963</u>
Farm	134	185	220	250
Nonfarm residential ^{a/}	42	55	75	100
Weighted average farm and nonfarm	119	165	195	225
Small commercial	204	240	270	325
Public buildings ^{b/}	20	30	40	50
Large commercial (annual)				
Coffman Gravel Pit		15,000	20,000	20,000

^{a/} As derived from raw data.

^{b/} Schools and churches.

E. C. Weitzell, Program Analyst
Office of the Administrator

January 26, 1953

Field Appraisal Section
Program Analyst's Office
Office of the Administrator

ANALYSIS OF BASIC FACTORS RELATED TO THE
RURAL ELECTRIFICATION LOAN FOR
TEXAS 85 WISE

This analysis of the present and probable future consumption of electricity for the Wise Electric Cooperative, Incorporated, with headquarters in Decatur, is based on a field study for Wise and Montague Counties and parts of Clay and Jack Counties, Texas. The field appraisal was conducted by Vergil Bufford, Agricultural Economist, and was completed in October 1952. It consisted primarily of visits to 120 served and potential farm consumers and 22 served and potential nonfarm consumers. Also, served commercials consisting of 1 large, 9 small and 8 schools and churches were visited.^{1/} This analysis was completed by Earl A. Gardner, Agricultural Economist. A map of the ultimate boundary of the service area is shown as Figure I.

ULTIMATE NUMBER OF CONSUMERS

As of August 31, 1952, this system was serving 2,533 consumers. The manager estimates that an additional 562 farm and 235 nonfarm and small commercial consumers either exist at present or are potential consumers resulting from new construction. This estimate by the manager was arrived at on the basis of the number of new connections made over the past few years. The appraiser was of the opinion that if population trends in the area were any criteria, the manager's estimates were optimistic; that it is doubtful whether the system will ever be serving any more consumers at any one time than they are at present. The area sample survey indicated approximately 700 vacant houses existed in the served area, part of which had services run but not in use at the time of the appraisal. It is not likely that all vacant houses will be occupied. However, with the normal new construction it can be assumed the manager's estimates are reasonable.

NATURE OF PRESENT AND INDICATED FUTURE CONSUMPTION
OF ELECTRICITY AS REVEALED BY THE SURVEY

The manager's letter (Figure 2) indicates only 7 consumers classified as nonfarm. However, the appraisal indicates approximately 15 percent of the consumers are nonfarm, according to the 1950 Census of Agriculture definition. The farm consumers interviewed indicated the greatest increase in expected future consumption. Actual consumption for 1951 and indicated increases within 3 years are shown in Table I.

^{1/} Respondents in the survey were selected from a BAE type area sample consisting of approximately 5 percent of the consumers.

TABLE I
INDICATED MONTHLY KWH CONSUMPTION^{a/}

Class of Consumer	Actual Consumption 1951	Total Indicated Within 3 Years	Percent Increase
1. Farm Consumers	134	185	38
2. Nonfarm Residential Consumers	42	52	24

^{a/} Based on presently connected consumers.

Historical consumption records for farm consumers in the survey indicated a generally rising average consumption. Also, consumers added in recent years appear to have attained initial averages higher than consumers connected over the longer period. This is revealed in the following tables:

TABLE II
AVERAGE MONTHLY KWH CONSUMPTION OF 103
FARM CONSUMERS AS SHOWN BY THEIR BILLING RECORDS

Total Number Years With Electricity	Number of Schedules	Average Kwh Consumption Per Month											
		1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
12	5	34	41	51	56	59	59	71	77	99	140	160	190
11	11	---	42	47	52	58	66	80	71	76	93	110	128
10	6	---	---	36	45	47	46	46	56	67	77	86	109
9	3	---	---	---	27	28	35	31	39	30	48	43	38
8	1	---	---	---	---	13	25	27	24	50	44	44	54
7	7	---	---	---	---	---	152	155	166	177	215	182	213
6	7	---	---	---	---	---	---	274	322	286	320	375	428
5	8	---	---	---	---	---	---	---	45	75	107	108	125
4	10	---	---	---	---	---	---	---	---	95	109	125	189
3	11	---	---	---	---	---	---	---	---	---	49	65	83
2	16	---	---	---	---	---	---	---	---	---	---	44	45
1	18	---	---	---	---	---	---	---	---	---	---	---	85
Weighted Average		34	42	45	48	50	75	116	113	115	125	119	135

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TABLE III

AVERAGE MONTHLY KWH CONSUMPTION OF 18
NONFARM CONSUMERS AS SHOWN BY THEIR BILLING RECORDS

Total Number Years With Electricity	Number of Schedules	Average Kwh Consumption Per Month											
		1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
12	1	6	9	7	3	21	22	25	93	128	127	110	82
11	2	---	18	22	21	24	27	26	24	36	28	38	50
10	1	---	---	29	45	56	42	56	65	53	45	49	67
8	2	---	---	---	---	33	41	42	61	44	42	40	41
7	2	---	---	---	---	---	16	25	24	29	26	54	56
3	5	---	---	---	---	---	---	---	---	---	28	30	42
2	5	---	---	---	---	---	---	---	---	---	---	33	41
Weighted Average		6	15	20	23	32	29	33	47	50	39	41	48

A saturation of electrical appliances and equipment, measured in terms of the percent of consumers presently having them and a corresponding percent anticipated in the future, was compiled from the field schedules for both farm and nonfarm residential consumers. The difference in saturation, as revealed by the increase in percentage points, was converted to future kwh requirements per 100 consumers for each appliance and equipment. This tabulation is shown in Table IV.

TABLE IV

PRESENT AND INDICATED SATURATION OF ELECTRICAL APPLIANCES
AND EQUIPMENT FOR ALL CONSUMERS IN SAMPLE AND ESTIMATED
INCREASE IN KWH USAGE

Appliance or Equipment	Percent of Consumers		Increase ^{a/}	
	Presently Using	Indicating Future Use	Percentage Points	KWH Usage (Per 100 Consumers)
Air Compressor	1	2	1	24
Air Conditioning Unit	1	2	1	2,820
Blanket	5	6	1	105
Broiler	1	1	—	—
Brooder, Hover	1	1	—	—
Churn	1	1	—	—
Clock	34	35	1	13
Clothes Drier	1	1	—	—
Cream Separator	1	1	—	—
Croquet Court	1	1	—	—
Drill Press	4	7	3	34
Evaporative Cooler	16	17	1	101
Fan (Household)	55	58	3	42
Food Mixer	28	33	5	122
Freezer (Cabinet)	11	30	19	17,730
Garden Watering	6	6	—	—
Germicidal Lamp	1	1	—	—
Heating Pad	23	24	1	2
Hot Plate	3	3	—	—
Irrigation Pumping	1	1	—	—
Iron	92	93	1	140
Ironer	3	4	1	84
Lathe	1	1	—	—
Lighting				
Dairy Barn	4	5	1	25
Garage	6	7	1	11
General Barn	12	16	4	122
House	97	99	2	504
Milk House	10	12	2	74
Other Buildings	18	22	4	42
Poultry Brooder House	4	4	—	—
Poultry Laying House	5	9	4	147
Shop	4	5	1	17
Yard	18	22	4	63
Livestock Watering	6	6	—	—
Milk Cooler	11	14	3	9,007

Texas 85 Wise - January 26, 1953 - 2-Table IV

Appliance or Equipment	Percent of Consumers		Increase ^{a/}	
	Presently Using	Indicating Future Use	Percentage Points	KWH Usage (Per 100 Consumers)
Milking Machine	11	14	3	2,016
Paint Sprayer	1	1	--	--
Percolator	20	20	--	--
Power Saw	1	2	1	8
Pressure System (less than 22')	2	3	1	126
Pressure System (over 22')	34	47	13	3,216
Radio	94	96	2	210
Range	3	7	4	5,040
Refrigerator	77	82	5	1,764
Roaster	7	7	--	--
Sewing Machine	18	19	1	14
Television Receiver	17	36	19	6,840
Toaster	33	33	--	--
Tool Grinder	4	7	3	70
Vacuum Cleaner	28	29	1	14
Ventilator Fan (Barn)	1	1	--	--
Ventilator (Attic)	1	2	1	70
Ventilator (Window)	1	1	--	--
Waffle Iron	24	25	1	35
Washing Machine	35	45	10	346
Water Heater (Dairy Pour- in-type)	5	9	4	5,250
Water Heater (House)	4	9	5	14,700
Water Heater (Pail)	1	1	--	--
Welder	--	1	1	105

a/ Based on average energy requirements determined by REA. Data do not reflect instances where more than one of the same appliance exist per consumer. These cases are rare and do not affect the over-all pattern materially.

ECONOMIC CHARACTERISTICS

Although the ultimate area to be served by this system extends into four counties, the majority of the consumers are located in Montague and Wise Counties. In order to provide the generalized background of economic information for this analysis, the 1945 and 1950 census data for these two counties were used. Approximately 81 percent of the lands in Montague and Wise Counties is in farms. Sixty-three percent is owned by the farm

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operators. The average size of farm increased during this 5-year period from 249 to 270 acres. The number of farms decreased 10 percent during this same period. The average value of land and buildings in 1949 was about \$10,500 per farm or nearly \$40 per acre. The average income per farm from the sale of agricultural products was \$2,700. This is 66 percent of the United States average income per farm in 1949. There has been a decrease of 16 percent in population for the two counties during the last 10 years as compared to an increase of 14.5 percent for the United States during the same period. Twenty-seven percent of the farm operators had off-farm incomes exceeding the sale of agricultural products in 1949. The same percent worked off the farm 100 days or more during the same year. The average size monthly electric bill per farm for March 1951 was \$4.74 as compared to \$7.44 for the United States. Seventy-six percent of the agricultural income was from the sale of livestock and livestock products. The remainder was from sale of crops such as cotton, peanuts, castor beans, watermelons, pecans and orchard fruit.

Nine banks serve Wise and Montague Counties. Their ratio of deposits to loans were 3.5 to 1 as of September 5, 1952. The Production Credit Association of Stephanville, Texas, had 93 loans totaling \$300,000 in Wise County in September 1952. The Farmers Home Administration had 71 loans in the 2 counties totaling \$110,000 as of March 31, 1952.

Beef cattle are the leading source of income in Montague County, while dairy predominates in Wise County. Markets for cattle, fluid milk and crops are Dallas, Fort Worth and Wichita Falls. There is adequate truck transportation to the markets. Hog and poultry production has been declining in recent years.

According to County Agent Annual Reports and the field appraiser, there has been a continuous drought in the service area for the past 3 years. This has happened since the 1950 Census of Agriculture data was compiled. The best estimates that can be obtained indicate it will take 3 to 5 years to bring the hay and grazing lands back to normal production. Crop lands should be restored in less time.

Two active oil wells are located in Wise County, producing over 900,000 barrels in 1950. In Montague County there are 1,400 wells, producing about 7 million barrels annually. Income from these wells and the availability of related work adds to the income of many of the farmers. Ninety percent of the farms reported having electricity and 15 percent telephone service as of April 1, 1950.

PHYSICAL CHARACTERISTICS

The topography of the area is rolling to hilly. The eastern part lies in Grand Prairie and the western part in West Cross Timber soils. The upland soils are sandy with alluvial soils on the bottom lands. Most of the top soils on the uplands have disappeared from wind and erosion and are suitable only for grazing and hay lands.

In addition to oil wells, there are gas producing wells, brick, pottery clays, coal and limestone for fertilizer. The production of coal declined sharply with the discovery of oil in northern Texas. Enough coal is produced for local consumption demands only.

Precipitation normally is about 30 inches annually in the two counties. The temperature varies from 112° to -30°. The growing season averages 229 days. For the past 3 years the rainfall has dropped to about 15 inches per year or approximately one-half of normal. Sleet storms occur once in every 6 years.

COMPETITIVE SOURCES OF ENERGY

Liquid petroleum and natural gas compete with electricity at the present time. Sixty-five percent of the consumers interviewed indicated they were using or planning on using LP gas, and 9 percent were using natural gas. Gas is being used primarily for cooking and house heating, with a few using gas for heating water and refrigeration. The following table shows the status of gas among the respondents interviewed.

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TABLE V

STATUS OF GAS USE, 142 RESPONDENTS
REPORTING IN RANDOM SAMPLE SURVEY

Respondents' Status With Respect to Use of Gas	Number of Respondents	Number of Appliances	Percent of Total
<u>Using</u>			
LP Gas	91		64
Natural Gas	12		9
<u>Not Using</u>			
And Not Planning to Use	37		26
But Planning to Use	2		1
<u>Using But</u>			
Planning to Change to Electricity	5	10	4
Not Planning to Change to Electricity	105	237	74
<u>Appliances Operated With Gas</u> <u>Presently Being Used</u>			
Ranges		98	
House Heating		93	
Water Heaters		28	
Refrigerators		18	
<u>Planning To Use</u>			
Ranges		1	
Water Heaters		2	
House Heating		2	

ANALYSIS OF FUTURE KWH CONSUMPTION

One-third of the estimated total load to be attained within 3 years from the time of the appraisal for farm and nonfarm residential consumers will be achieved principally from the addition of refrigerators, water heaters and cabinet freezers in the home. One-fourth will be from farm uses, mainly milk coolers, water heaters and milking machines. These items are of major importance on dairy farms producing fluid milk.

Compared with average country-wide usage of appliances as determined by REA, farm consumers were using electricity at 78 percent of this average use; for nonfarm consumers the rate was 58 percent. Adjustments for these differences have been made in tables showing indicated usage.

Since 1940 for those consumers interviewed, average monthly farm consumption for the cooperative rose from 34 kwh to 135 kwh during the past 12 months prior to the field appraisal. This is an increase of 9 kwh in the average monthly usage for the year. Since the end of World War II in 1946, at which time electrical appliances and equipment were becoming generally available, the average monthly usage increased an average of only 4 kwh monthly. Part of this can be attributed to the 3 years of drought during this period, according to the field appraiser, and to the addition of many new consumers. The nonfarm residential consumers increased an average of about 4 kwh monthly since 1940, and 3 kwh monthly since 1946.

Table VI shows the indicated and estimated future consumption broken down by character of total load.

TABLE VI

INDICATED AND ESTIMATED KWH USAGE FOR
CONSUMERS BY CHARACTER OF LOAD

Use	Indicated			Estimated
	Percent Saturation Within 3 Years	KWH Per 100 Consumers	Percent of Total	Annual Kwh Per 100 Consumers
<u>Major Household Uses</u>				
Refrigerators	83	29,916	11.7	20,000
Water Heaters	9	27,480	10.8	20,000
Cabinet Freezers	30	27,270	10.7	20,000
House Lighting	100	24,168	9.5	18,000
Television Receivers	36	12,924	5.1	9,000
Pressure Systems	50	11,832	4.7	11,500
Radios	108	10,840	4.2	6,000
Irons	93	9,290	3.6	9,000
Ranges	7	8,400	3.3	7,500
Air Conditioning Units	3	5,640	2.2	5,000
<u>Major Farm Uses</u>				
Milk Coolers	13	42,863	16.8	32,000
Water Heaters	9	12,810	5.0	9,500
Milking Machines	14	10,152	4.0	9,000
Irrigation Pumping	1	1,400	.5	1,000
Livestock Watering	6	1,134	.4	800
<u>Other Uses</u>				
Miscellaneous	---	19,086	7.5	13,500
Total		255,205	100.0	191,800
Annual average estimated kwh for farm and nonfarm residential consumers 3 years after the field appraisal				1,918
Monthly average estimated kwh for farm and nonfarm residential consumers 3 years after the field appraisal				160

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OTHER CLASSES OF CONSUMERS

Other classes of consumers consist of one commercial consumer classified as large, small commercial consumers, schools and churches. A sample of the small commercial consumers' probable future kwh consumption is indicated as follows:

<u>Name of Commercial</u>	<u>Estimated in 3 Years</u>	
	<u>Kw Demand</u>	<u>Average Monthly KWH</u>
<u>Large</u>		
Coffman Gravel Pit	60	1,250
<u>Small</u>		
R. C. Goodrum (General Store)		200
Wabash Oil Company		10
Joe Crites (Store and Filling Station)		30
Texas Pipe Line Company (Cathode Unit)		75
" " " " " "		75
Martin Garage		50
Bluff Creek Oil Company		250
J. R. Matlox (Store and Gas Station)		350
J. E. King (General Store)		225

In view of the available data and the foregoing analysis, it is certified the following average monthly estimates are reasonable and may be expected to be attained by the years specified:

<u>Class of Consumer</u>	<u>12 Months Ended</u>			
	<u>November 30, 1952</u>	<u>1955</u>	<u>1958</u>	<u>1963</u>
Farm	134	185	220	250
Nonfarm residential ^{a/}	42	55	75	100
Weighted average farm and nonfarm	119	165	195	225
Small commercial	204	240	270	325
Public buildings ^{b/}	20	30	40	50
Large commercial (annual)				
Coffman Gravel Pit		15,000	20,000	20,000

^{a/} As derived from raw data.

^{b/} Schools and churches.

